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(71) Applicant (for all designated States except US): **EMBRI-
ONICS LIMITED** [NZ/NZ]; Waikato Innovation Park,
Ruakura Road, Hamilton, 2001 (NZ).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **FRONTIN-ROLLET,
Andrew** [NZ/NZ]; Waikato Innovation Park, Ruakura
Road, Hamilton 2001 (NZ).

(74) Agents: **PIPER, James William** et al.; Floor 1, 29 Water-
loo Road, Lower Hutt, 6009 (NZ).

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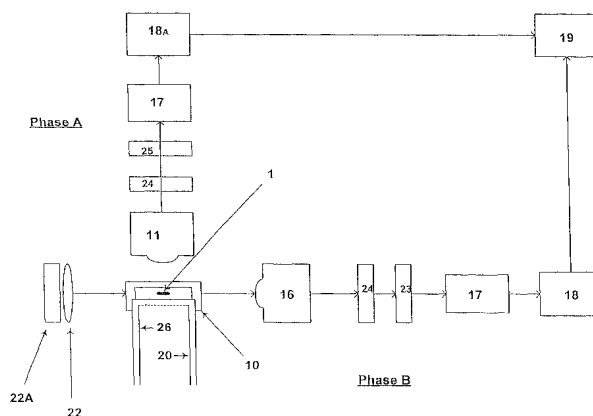
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(54) Title: A METHOD AND APPARATUS FOR ORIENTING SPHERICAL CELLS



(57) **Abstract:** The invention relates to a method that uses the orientation of a sperm cell to determine cell differences due to size, mass, or density. Cell differences such as differences in DNA mass are used to distinguish X chromosome-bearing sperm cells from Y chromosome-bearing sperm cells and therefore have use in in-vitro and in-vivo fertilisation procedures. The orientation of individual sperm cells is determined by measuring non-fluorescent light. The method uses one detector to measure the magnitude of fluorescence (for DNA (sex) measurement from the flat surface of the spermatozoon), and a second detector to measure the magnitude of refracted non-fluorescent light derived from a separate light source. The separate light source is derived from part of a phase contrast or Dark field optical system to provide orientation data. Importantly, all excitation and fluorescent light is excluded from the second detection system by band-pass optical filters thereby providing for a cleaner signal from the concave edge (no fluorescence signal from the flat surfaces of the spermatozoon). It is reported that the orientation of a sperm cell when determined by passing light using optical phase contrast or Dark field optics through a sperm cell of interest provides for improved efficiencies, improved processing speeds and increased reliability in the results obtained. A further aspect of the invention describes an immobilising or ablative laser for immobilising or destroying unwanted sperm.



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